

# Development of a Direct Carbon Fuel Cell for Power and Fuels Cogeneration Directly from Plastic Trash, Phase I

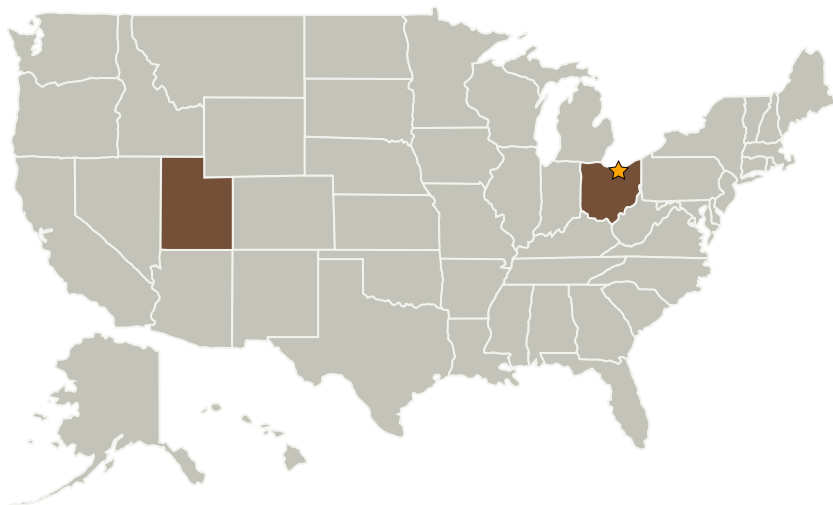
Completed Technology Project (2009 - 2009)



## Project Introduction

This small business innovation research is intended to develop a simple processing concept based-on an advanced direct carbon fuel cell (DCFC) technology enabling directly converting plastic trash into life support consumables (such as H<sub>2</sub>, CO<sub>2</sub> and H<sub>2</sub>O) and electricity simultaneously, for supporting Lunar ISRU development. The proposed innovation involves the areas associated with the advanced DCFC characteristics and simplified processes turning plastic trash into renewable energy at a high efficiency. In Phase I, the decomposition/oxidation electrochemistry of polyethylene-based plastic bags and spoons, catalyzed by molten carbonate anode composites, will be characterized. Tubular electrochemical cells built upon the proposed DCFC technology will be studied at elevated temperatures, followed by performance optimization.

## Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Materials and Systems Research, Inc.	Supporting Organization	Industry Minority-Owned Business	Salt Lake City, Utah



Development of a Direct Carbon Fuel Cell for Power and Fuels Cogeneration Directly from Plastic Trash, Phase I

## Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Organizational Responsibility	1
Project Management	2
Technology Areas	2

## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Center / Facility:

Glenn Research Center (GRC)

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

# Development of a Direct Carbon Fuel Cell for Power and Fuels Cogeneration Directly from Plastic Trash, Phase I

Completed Technology Project (2009 - 2009)



## Primary U.S. Work Locations

Ohio

Utah

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

Carlos Torrez

## Technology Areas

### Primary:

- TX11 Software, Modeling, Simulation, and Information Processing
  - └ TX11.1 Software Development, Engineering, and Integrity
    - └ TX11.1.2 Verification and Validation of Software systems